

Example #10: A 3.0 kg lab cart going 15 m/s runs into a 10 kg stationary lab cart so that it takes a speed of 6.0 m/s. What is the velocity of the 3.0 kg lab cart after the collision?

before

$$P_T = 3(15) \\ = 45$$

after

$$P_T = 10(6) + 3v \\ = 60 + 3v$$

$$45 = 60 + 3v$$

$$\boxed{v = -5.0 \text{ m/s}}$$